

WHAT IS CLAIMED IS:

1. A manufacturing system for an alloy material containing rare earth metals comprising:

5 a melting furnace for melting a starting material alloy containing rare earth metals,

solidifying means for continuously cooling and solidifying an alloy melt discharged from the melting furnace into alloy flakes,

10 crystal structure controlling means for controlling a crystal structure of the alloy flakes into a desired state, and

cooling means for cooling the alloy flakes,

15 wherein at least said melting furnace, said solidifying means, said crystal structure controlling means, and said cooling means are operable in an inert gas atmosphere,

20 said crystal structure controlling means further comprising a conveying device having a delivery space for continuously delivering the alloy flakes from the solidifying means to the cooling means, said conveying device having temperature regulating means for regulating the temperature of said delivery space to a desired temperature.

25 2. The manufacturing system of claim 1, wherein said conveying device has a rotatable pipe (A) defining said delivery space therein, and provided with a fin extending

spirally along its inner surface at a particular angle, wherein said pipe (A) is provided with at least one of a heat insulating layer and a heating section as said temperature regulating means.

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3. The manufacturing system of claim 2, wherein said conveying device comprises connected pipes consisting of a plurality of said pipes (A) connected with each other, wherein each of said pipes (A) is provided with said temperature regulating means for controlling the temperature of each pipe (A) independently from others.

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4. The manufacturing system of claim 2, wherein said conveying device comprises a multiple pipe consisting of a plurality of pipes (A) arranged coaxially, wherein each of said pipes (A) is provided with said temperature regulating means for controlling the temperature of each pipe (A) independently from others.

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5. The manufacturing system of claim 1, wherein said cooling means comprises a container for containing alloy flakes discharged from the crystal structure controlling means, and a cooling medium feed unit for circulating a cooling medium through a hollow structure of walls of said container.

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6. The manufacturing system of claim 4, wherein said

cooling means comprises a rotatable cylindrical cooling device, wherein said cylindrical cooling device is arranged coaxially around said multiple pipe.

5     7. The manufacturing system of claim 6, wherein said cylindrical cooling device has a plurality of fins on its inner surface.

10    8. The manufacturing system of claim 6, wherein said cylindrical cooling device has a cooling medium circulating means in a wall of the cylindrical cooling device.

15    9. The manufacturing system of claim 1, wherein said solidifying means comprises a cooling and solidifying device for cooling and solidifying the alloy melt into ribbons or flakes, and a tundish for guiding the alloy melt from the melting furnace to the cooling and solidifying device.

20    10. The manufacturing system of claim 9, wherein said solidifying means comprises a crushing section for crushing solidified alloy from the cooling and solidifying device.